



# **LABORATORY DIRECTED RESEARCH AND DEVELOPMENT**

## **FY 2013 PLAN**

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## EXECUTIVE SUMMARY

Laboratory Directed Research and Development (LDRD) funds enable creative and innovative R&D projects at Ames Laboratory (AMES) that directly support our mission. Selection of projects is the responsibility of the Laboratory Director.

The LDRD program objectives are to stimulate innovation and creativity, and to enhance the research activities to keep the Ames Laboratory at the forefront of science and technology. LDRD funding will continuously renew the Laboratory's scientific and technological vitality, and enable AMES to respond to rapidly emerging R&D opportunities of clear potential benefit to DOE's mission. The program enhances AMES' ability to attract and retain the high-caliber scientists and engineers essential to pursue the mission of DOE and the needs of the nation. The LDRD program helps insure that AMES will continue providing scientific and technical leadership in its mission areas. AMES' annual Lab Plan and 5-year scientific strategic plan, which identify our major initiatives, inform strategic areas for LDRD, consistent with our mission.

The requested annual LDRD budget is developed after careful consideration of investment needs, affordability, directives from DOE and Congress, and compliance with order DOE O 413.2B governing LDRD programs.

The LDRD program provides support for *Strategic Initiatives, Novel Projects, and Exceptional Opportunities that enhance the Laboratory's ability to achieve its mission, and for which no other source of funds is available*. *Strategic Initiatives* are employee-initiated proposals that address at least one of the strategic goals or an area of potential growth within AMES' initiatives for the current fiscal year. *Novel Projects* are a balance of basic, applied, single-investigator, and multidisciplinary projects in new areas or directions, not necessarily in direct support of our strategic initiatives. *Exceptional Opportunities* is an integral part of the pursuit of capabilities in a strategic area that enhances human and physical resources to support that area. This component consist of projects that do not fit neatly into the other two components or that can arise outside the normal fiscal-year schedule, e.g., strategic hires, collaborations with external institutions where a superior expertise resides, or projects offering exceptional R&D opportunities for AMES. The laboratory director retains the option to identify and support these exceptional types of LDRD projects.

Review procedures will insure that proposals identified as strategic in nature are assessed for scientific quality, innovativeness, and value to mission-related initiatives. After a completed review process, final approval of all LDRD projects and spending plans, as well as centralized annual reporting of accomplishments to DOE, is handled through the Office of the Laboratory Director. Management and execution of the research itself are the responsibility of the research Principle Investigator, along with the AMES' technical divisions and programs, while environmental and safety reviews are handled, as typical, by Environmental, Safety, Health and Assurance (ESH&A) in conjunction with the Safety Review Committee (SRC).

## LABORATORY MISSION

Ames Laboratory's mission is to create materials, inspire minds to solve problems and address global challenges. The mission of the Energy Department is to ensure America's security and prosperity by addressing its energy, environmental and nuclear challenges through transformative science and technology solutions. AMES serves DOE and supports its mission by applying world-class science and engineering expertise to complex challenges within DOE mission areas using a combination of unique local and DOE-facilities. AMES delivers innovative research and technology. AMES scientists and engineers create knowledge and technologies to provide innovative solutions to materials, energy, environmental, and security challenges that address the most important scientific and societal needs of our Nation in the near and long term. In accomplishing our mission, we partner with DOE, other federal laboratories and agencies, the academic community, and the private sector.

Our major initiatives directly support AMES' and DOE's goals to create innovative and transformational solutions to the Nation's grand scientific and technological challenges.

## AMES LABORATORY'S STRATEGIC INITIATIVES

The current call for proposals refers prospective LDRD investigators to descriptions of the AMES' strategic initiative areas. These initiative areas are well matched to DOE mission components and the Laboratory's 5-year Strategic Plan, where full descriptions may be found and these are also detailed in AMES' (Document Controlled) LDRD Plan for Management and Administration. By referring to descriptions such as these in calls for proposals, we insure relevance of AMES' LDRD portfolio to identified priorities of the Laboratory and DOE.

## FY 2013 RESOURCES REQUEST

The annual LDRD budget is developed after careful consideration of investment needs, affordability in our indirect budgets, directives from DOE and Congress, and compliance with order DOE O 413.2B governing the LDRD programs.

**In FY2013, the Ames Laboratory requests approval for an LDRD expenditure comprising 3% of AMES' projected FY total costs,** estimated to be approximately \$900K. The Director proposes a funding portfolio shown in **Tables 1 and 2** for the most recent, current, and next fiscal year, supporting the *Strategic Initiatives, Novel Projects, and Exceptional Opportunities*. These projects' datasheets are provided in addition to this Plan for DOE review and approval.

The Laboratory's request reflects management's best judgment as to the optimal balance between LDRD funds with their inherent flexibility and funds needed to accomplish programmatic deliverables for current sponsors while satisfying competing demands on Laboratory overhead. By insuring an adequate LDRD resource, laboratory management has a more effective tool to open new opportunities for creative Science & Technology directions and to adjust rapidly to new mission needs of the Department.

Due to the nature of exploratory research we cannot predict precisely to what program a given project may turn out to be most valuable over time. Nonetheless, the Congress of United States understands this role of exploratory R&D that underlies its granting the directors of national laboratories the opportunity to pursue laboratory-directed R&D and enables the laboratories to manage this vital resource and insuring its productivity and relevance to the needs of the Nation.

## LDRD GENERAL DESCRIPTION AND JUSTIFICATION

AMES' Laboratory Directed Research and Development (LDRD) program pursues new and innovative research with the potential to open future opportunities or uncover new ones for DOE programs, as well as to develop potential technologies to industry. LDRD resources serve several vital roles: (1) early exploration of new research areas or concepts, (2) expansion of our capabilities to benefit a wide variety of mission-related research programs, (3) early investment in creative, high risk ideas and (4) seeding of work from which future research programs may grow.

Researchers' enthusiasm is stimulated by the knowledge that outstanding new ideas can compete for timely support. LDRD is one of the normal costs of doing business for DOE National Laboratories, such as AMES. It maintains AMES' readiness to serve the future needs of DOE.

### *LDRD Objectives*

The objectives of AMES' LDRD portfolio are to enhance the Laboratory's ability to achieve its mission by enabling selected critical projects for which no other source of funds is available. LDRD funds will be used: (1) to foster innovation and creativity from the scientific and technical staff by supporting their pursuit of novel, forefront science and technology research ideas, new concepts, and high-risk/high-reward research and development projects; (2) to develop, recruit, and retain the researchers needed to maintain and enhance the scientific, engineering, and technical vitality and capabilities of the Laboratory; (3) to exploit the technical potential of the Laboratory for the benefit of the nation; and (4) to enable the Laboratory's R&D planning by supporting its mission and strategic plans, as described in its Strategic and Lab Plans.

The LDRD program provides support for *Strategic Initiatives*, *Novel Projects*, and *Exceptional Opportunities*. *Strategic Initiatives* are employee-initiated proposals that address at least one of the strategic goals or an area of potential growth within AMES' initiatives for the current fiscal year. *Novel Projects* are a balance of basic, applied, single-investigator, and multidisciplinary projects in new areas or directions, not necessarily in direct support of our strategic initiatives. *Exceptional Opportunities* is an integral part of the pursuit of capabilities in a strategic area that enhances human and physical resources to support that area. This component consist of projects that do not fit neatly into the other two components or that can arise outside the normal fiscal-year schedule, e.g., strategic hires, collaborations with external institutions where a superior expertise resides, or projects offering exceptional R&D opportunities for AMES. The laboratory director retains the option to identify and support these exceptional types of LDRD projects.

### *General Characteristics of LDRD Projects*

LDRD projects are pursued in forefront areas of basic and applied science and technology that support the DOE mission, enrich Laboratory capabilities, generally advance the knowledge and technology base, and have the potential to generate follow-on funding from DOE offices and programs. Individual LDRD projects will be relatively small and generally fall into one or more of the following categories.

1. Advanced study of hypotheses, concepts, or innovative approaches to scientific, technical, or computational problems.

2. Experiments, theoretical studies, simulations, and analyses directed toward “proof of principle” or early determination of the utility of new scientific ideas, technical concepts and devices, or research tools.
3. Concept creation and preliminary technical analyses of advanced, novel experimental facilities/devices or of facilities for computational science.

All LDRD proposals are required, in the annual call for proposals, *to identify how the work differs from other programmatic funding.*

#### *Selection Criteria*

AMES’ LDRD program carefully screens all proposals for LDRD projects to assure consistency with the character of projects as defined in DOE Order 413.2B, to ensure compliance with that Order, and to verify consistency with DOE’s and AMES’ internal guidance. Beyond that, AMES’ primary criteria are scientific and technical excellence, innovativeness, relations to DOE mission, cross-disciplinary character, and (for strategic proposals) contribution to AMES’ strategic goals and objectives.

#### **LDRD MANAGEMENT and ADMINISTRATION**

Research activities at Ames Laboratory are organized under the Chief Research Officer, who is the principal advisor to the laboratory director on matters involving the LDRD portfolio, and who oversees administration of the program. Certain tasks such as LDRD proposal review and evaluation are delegated to managers, directors, initiative leaders, peer reviewers, and review panels. They provide recommendations to the laboratory director who approves final project selection and funding allocations. All programs, including LDRD, benefit from the guidance of the Lab’s Executive Council.

The LDRD Program Coordinator, under the guidance of the Chief Research Officer, is responsible for oversight administration of LDRD funds and for coordination of LDRD reports and plans. This responsibility includes review of proposals for adherence to DOE Order 413.2B, DOE guidelines, laboratory administrative procedures, and submission of requests to DOE for advance concurrence on projects selected for funding. At the end of the fiscal year, progress on and accomplishments of all LDRD projects are reported to the laboratory director and forwarded to DOE through the AMES’ site office. Also at the end of the year, the LDRD Program Coordinator manages the transmittal of project data to the LDRD database maintained by the DOE/CFO.

Using the Ames Laboratory’s Pre-Proposal Form process, established for all non-LDRD proposal submissions, the LDRD Program Coordinator confirms with other administrative offices that appropriate oversight is in place to assure compliance with financial, health, and safety and security requirements, and works with these and other offices to collect ancillary LDRD-related information (such as publications and invention disclosures). Certain controls, such as limiting the duration of LDRD projects to a maximum of 36 months, are incorporated into a data collection system maintained by LDRD Program Coordinator.

Responsibility for the actual conduct, safety, and technical supervision of all LDRD projects resides with line management and the individual employee researchers. LDRD program as a whole and accomplishments are periodically assessed by a review committee chartered by our

Contractor, Iowa State University, as well as by DOE program reviews and by an internal review of progress for projects desiring to continue.

Annually, the laboratory director determines the appropriate balance of funding between the *Strategic Initiatives* and *Novel Projects* components of the LDRD program. As part of this allocation process, a fraction of the total allowed expenditure may be temporarily reserved to handle *Exceptional Opportunities*, i.e., mid-year opportunities, strategic hires for LDRD projects (including possible support for one or more *Spedding Distinguished Post-doctoral Fellowships*), special LDRD collaborations, and pre-commercial development of AMES-based DOE-developed technologies to enable their beneficial future use by other agencies' programs and by the private sector. This balance of LDRD funded activities will be provided to DOE for approval in the LDRD Annual Plan.

### ***Details and Requirements of LDRD Projects***

#### **Length of Projects**

LDRD projects are funded by the fiscal year cycle, *October 1 to September 30*. Projects requiring funding beyond one fiscal year may be considered for funding in out years, but must be resubmitted and re-competed with new proposals. No commitment for out-year funding is made when a project requests multiyear funding. Projects are limited to a maximum funding period of three years (36 months). Project account(s) close at the end of the Laboratory's fiscal year, if a project has not received continuation funding, or when the budgeted allocation is exhausted (assessed via encumbrances), whichever occurs first. Because they are from laboratory overhead, any LDRD surplus funds at end of fiscal year must be returned to the laboratory (they cannot be redirected or carried over to other fiscal years).

#### **Appropriate LDRD Expenditures**

With the exception of the restrictions below, LDRD projects may be charged the same allowable costs normally associated with similar R&D activities at the Laboratory, including fully burdened payroll, benefits, materials and supplies, program burden, travel to user-facilities, and capital equipment in direct support of a project or support for participation by non-laboratory personnel. LDRD funds must be carefully managed to ensure appropriateness and accountability of all charges. Project account(s) close at the end of the Laboratory's fiscal year, if a project has not received continuation funding. LDRD projects cannot cost in excess of allocated funds, and will be closed when the budgeted allocation is exhausted (assessed via encumbrances), or at the end of the fiscal year, whichever occurs first. Because they are from laboratory overhead, any LDRD surplus funds at end of fiscal year must be returned to the laboratory (they cannot be redirected or carried over to other fiscal years).

#### **Possible Increases to Funded LDRD Project**

A project may request an increase in the approved project funding in a given year, as provided in Ray Orbach's guidance memorandum (19 June 2006) on fulfilling DOE Order 413.2B (19 April 2006). On exceptional occasions, with approval of Laboratory Director, having received a strong and compelling justification, the CRO on behalf of the LDRD Program can a request from the Site Office a cumulative budget increase greater than or equal to 50% over DOE approved amount or \$200K, which ever is less. Increases up to \$25K do not require concurrence. The project must submit a data sheet to accompany the request to Site Office.

## **Restrictions**

Consistent with the DOE Order, LDRD funds will not be used to:

- (1) Substitute for or increase funding for any tasks for which a specific limitation has been established by Congress or DOE, or for any specific tasks that are funded by DOE or other users of the laboratory.
- (2) Fund projects that will require the addition of non-LDRD funds to accomplish the technical goals of the LDRD project.
- (3) Fund construction design beyond the preliminary phase (e.g., conceptual design, Title I design work, or any similar or more advanced design effort) or to fund construction line-item projects, in whole or in part.
- (4) Fund general-purpose capital expenditures with the exception of acquisition of general-purpose equipment that is clearly required for the project and is not otherwise readily available from the laboratory inventory.

The first restriction attempts to insure consistency with Congressional budget decisions. Consequently, any LDRD support perceived as augmenting existing program funding is not allowed. All LDRD proposals are required in the annual LDRD call for proposals to identify how the work differs from other programmatic funding.

The second restriction follows from the first in that no LDRD project can be a supplement to current funding or an obligation on future funding. Typically, this is taken to mean that LDRD projects must reach "a useful stage of completion" within the proposed lifetime of the project, and should identify specific aims that can be achieved within the annual funding cycle.

The third restriction is to insure that LDRD supports preliminary R&D research in keeping with the General Characteristics defined above.

The fourth restriction is so that no LDRD proposal with capital equipment can be funded that does not have an operating budget. The self-contained nature of an LDRD project (see restriction two) requires that some useful outcome must be achieved with the equipment being purchased. Therefore, capital equipment allocations are made for the year and the purpose defined in the LDRD proposal, and the project must have an operating allocation to conduct some R&D activity for the stated purpose.

In keeping with the general characteristics of LDRD projects as well as these restrictions, projects should not have a high proportion of administrative support costs (i.e., standard program burden). As specified, conferences and workshops should be funded through other sources. Joint lab/industry technology transfer activities likewise should be funded through the Cooperative Research and Development Agreement (CRADA) process, although a "pre-Tech Transfer" research or development project is allowable under the LDRD program.

## **Solicitation of Proposals**

Specific emphasis for the yearly LDRD research portfolio is conveyed via target funding allocations and an approved annual call for proposals, and is reinforced during project selection and progress reviews. The LDRD Program Coordinator and Chief Research Officer will draft the annual LDRD call for proposals, approved by the Executive Council, and issued by the Director. The approved annual LDRD call will be distributed to Directors and Division Administrators, with direct notification to Ames Laboratory scientific staff. The call will also be publicized in electronic



mailings and online. The call will describe the criteria for project selection, and will provide guidance on proposal content and structure. A schedule for proposal submission, review, and award announcement will be included. The call is typically issued in January or February with proposals due sometime in March or April to division offices, for planned 1 October start date. Using the Ames' PPF (pre-proposal form) proposals for LDRD funds, the PI can submit proposal with approval of the principal investigator's Division/Program.

### **Selection of Projects**

The Laboratory Director is responsible for establishing an internal process for the selection of LDRD projects with criteria that emphasize scientific and technological excellence. Per the Director's guidance, the CRO will utilize scientific management and/or peer review to evaluate proposals based on these criteria. This process should be uniformly applied throughout a given fiscal year, but may be revised from one year to the next. Under CRO directions, Division and Program Directors (and possibly other experts) will provide review and comment on proposals from their areas, and may be asked to provide additional input, depending on the process established by the Director. The Chief Research Officer and others engaged in AMES' research planning and assessment will ensure alignment of the portfolio with DOE missions, the AMES' 5-year Strategic Plan and the annual Laboratory Plan.

### **Reporting Requirements**

The enacting legislation and other DOE documents for LDRD requires both a *pre-project approval* by the appropriate government agency (e.g. DOE AMES' Site Office) on all proposed projects, and a *publicly available summary report* on completed projects.

The *pre-project approval* for all proposed projects are done using a "datasheet" prepared by the LDRD Program Coordinator from the coversheet information and descriptions required in the LDRD call for proposals. Also, summary information (Title, Brief Abstract, Lead Investigators, and Estimated Cost) from these datasheets goes to the AMES' Site Office, which will make them available to appropriate entities, including Congress.

For the *summary report*, principal investigators must prepare a brief annual report on their project within sixty days of the end of the fiscal year. The LDRD Program Coordinator compiles these individual reports and prepares an Annual Report on the LDRD program for submission to DOE within 6 months of the end of the fiscal year. This Annual Report is also submitted to the Office of Scientific and Technical Information for the DOE, and posted on the World Wide Web. Guidance for preparing the annual project report will be provided, by the LDRD Program Coordinator, to the Principal Investigator(s) when the request for the project reports is sent out.

Also, the LDRD Program Coordinator prepares an *annual LDRD Program Plan* giving an overview of the AMES' program and requesting the funding level for the upcoming fiscal year. DOE requires other reports on LDRD, and there may be inquiries from DOE or other agencies or Congress concerning the LDRD program. Special assistance or information from program and division offices or principal investigators might be required on occasions to fulfill such requests.

## ***PROPOSAL SUBMISSION AND POST FUNDING PERFORMANCE ACTIVITY***

### **PROPOSAL SUBMISSION**

Ames Laboratory will develop and maintain an online site for LDRD ([www.ameslab.gov/LDRD](http://www.ameslab.gov/LDRD)) that will contain requirements for LDRD online submission of pre-proposal and full proposals, pre-approval forms, PPF submission, reporting, etc., including templates. The proposal submission will be through internal (access controlled) link.

### **REPORTING and OVERSIGHT**

Annual LDRD Resource Request Plan ([LDRD 30000.002](#)) is required at the Ames' Site Office at least 45 days before the start of the fiscal year. In addition, LDRD Portfolio Tables will be provided in Section 4.2 of LDRD Resource Request Plan.

As required in Reporting Requirements (Section 7), a "datasheet" template is required from each principle investigator during the pre-approval process, so as to provide project summary information (Title, Brief Abstract, Lead Investigators, and Estimated Cost). Summary information from these datasheets goes to the Ames' Site Office, which will make them available to appropriate entities, including Congress. Datasheets must be submitted to Site Office at least 30 days prior to the start of the fiscal year to allow at least 30 days for review; for late-start projects, datasheets may be submitted any time in the fiscal year.

In addition, a *summary report* from each principal investigator must be prepared for a brief annual report on their project within sixty days of the end of the fiscal year. An Office WORD Document Template prepared by LDRD Program is available from program office and website. The LDRD Program Coordinator compiles these individual reports and prepares an Annual Report on the LDRD program for submission, which is required within 6 months after the end of the fiscal year. The CRO, LDRD Program Administrator, and Budget will work together on Budget and Reporting to Site Office and DOE.

### **BUDGET OVERSIGHT**

Working with Budget and Division/Program Offices, the LDRD Project Coordinator will ensure compliance with LDRD expenditures and closing of projects accounts. LDRD projects cannot cost in excess of allocated funds, and will be closed when the budgeted allocation is exhausted, or at the end of the fiscal year, whichever occurs first. Through current Ames Laboratory practice, the project accounts will be monitored and assessed on encumbrances relative to approved budget. Because they are from laboratory overhead, any LDRD surplus funds at end of fiscal year will be returned to the laboratory (they cannot be redirected or carried over to other fiscal years). The CRO, LDRD Program Administrator, and Budget will work together on Budget and Reporting to Site Office and DOE.

### **Additional Ames Laboratory Supporting LDRD Documentation**

- Project Datasheet (Fillable PDF)
- Annual Reporting Template (MS Word document)
- LDRD Training Presentation (PPT and PDF), includes
  - Overview of LDRD (DOE and Ames Lab)
  - Flow Chart for LDRD Review and Selections Process
  - Review Criteria – Scoring Sheet
  - Project Proposal Requirements